

Appl. No. 10/807,524
Amdt. dated Aug. 18, 2005
Reply to Office Action of May 18, 2005

Amendments to the Drawings:

The attached sheet of drawings includes changes to FIG. 5. This sheet, which includes FIGs. 4 and 5, replaces the original sheet including FIGs. 4 and 5. In FIG. 5, the orientation of reference numerals "105" and "110" have been corrected such that they are readable from left to right.

Attachment: Replacement Sheet
 Annotated Sheet Showing Changes

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REMARKS/ARGUMENTS

1. The Examiner rejected claims 1-17 under 35 U.S.C. § 103(a) as being unpatentable over Kellerman et al. (U.S. Patent No. 6,639,558) in view of Lennen et al. (U.S. Patent No. 5,515,057). Reconsideration of this application is respectfully requested in view of the amendments and/or remarks provided herein.

Rejections under 35 U.S.C. § 103(a)

2. Claims 1-17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kellerman et al. (Kellerman) in view of Lennen et al. ("Lennen"). In particular, the Examiner asserts that Kellerman discloses a stacked patch antenna, but fails to disclose a differential feed. The Examiner then relies upon Lennen to allegedly disclose a patch antenna having a differential feed and concludes that it would have been obvious to one of ordinary skill in the art to apply the feed system disclosed in Lennen to the stacked antenna arrangement disclosed in Kellerman. Applicants respectfully disagree with the Examiner's characterization of the present invention in view of the cited references.

While Kellerman may disclose a stacked patch antenna arrangement, Applicants submit that Lennen does not disclose a *differential* feed system for a patch antenna. Instead, Lennen discloses a *quadrature* feed system for a patch antenna. As evident from a careful review of Lennen, Lennen discloses a double patch antenna (50) having a pair of two point feed systems (64, 69)--one two point feed system for each of two resonating frequencies. See FIG. 3A; col. 10, lines 8-27. The feed points (56, 58) of the first two point feed system (64) are offset in phase by 90 degrees. See col. 10, lines 20-23. Similarly, the feed points (66, 68) of the second two point feed system (66) are also offset in phase by 90 degrees. See FIG. 3A. Thus, each two point feed system (64, 66) disclosed in Lennen is a quadrature feed system in which the signals at each feed point of the respective system are offset by 90 degrees (i.e., point 58 is offset 90° from point 56 and point 68 is offset 90° from point 66).

Lennen also discloses a four-point feed system for each patch of a patch antenna (70). See FIG. 3B; col. 10, line 65 through col. 11, line 34. However, like the two-point feed system

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discussed above, each pair of points in the four-point system is offset in phase by 90 degrees (see e.g., paired points 76 and 78, and 80 and 82 in FIG. 3B).

By contrast, Applicants' independent claim 1 recites an antenna system having two or more patch antennas in a stacked arrangement, wherein at least one of the patch antennas comprises a differential feed patch antenna. Applicants expressly define a "differential feed arrangement" as "one in which a structure is excited by two signals which have the same amplitude, but a (nominal) *180-degree* difference in phase." See page 8, lines 22-24 of Applicants' originally filed specification (emphasis added). Based on this definition of "differential feed", Applicants' claim recites a patch antenna excited by two signals offset in phase by *180 degrees*. Lennen fails to disclose or suggest such a patch antenna. Rather, Lennen discloses a patch antenna excited by two signals (56, 58) offset in phase by *90 degrees*. As a result, the combination of Kellerman and Lennen fails to disclose or suggest all the limitations of claim 1. Therefore, Applicants respectfully request that the rejection of claim 1 be withdrawn and said claim be passed to allowance.

Claims 2-17 are dependent upon claim 1, which claim has been shown allowable above. Therefore, since claims 2-17 each introduce additional subject matter that, when considered in the context of the recitations of claim 1, constitutes patentable subject matter, Applicants respectfully submit that the recitations of claims 2-17 are not disclosed or suggested by Kellerman and Lennen, whether taken alone or in combination. Further, with respect to claims 8 and 11, neither Kellerman nor Lennen disclose or suggest the use of a patch antenna feed system having two *orthogonal pairs* of feed points. Instead, Lennen discloses two *parallel pairs* of feed points (e.g., paired points 56, 58 are parallel to paired points 66, 68 in FIG. 3A and paired points 80, 82 are parallel to paired points 76, 78 in FIG. 3B). Therefore, Applicants respectfully submit that claims 2-17 are in proper condition for allowance.

Amendments to the Specification

3. Applicants have herein amended paragraphs 0005, 0007, 0008, 0010, 0016, 0017, 0018, 0019, 0021, 0022, 0023, 0024, 0026, 0027, 0028, 0029 and 0030 of the specification to correct minor informalities contained therein. Applicants submit that no new matter has been added by such amendments.

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Other Amendments to the Claims

4. Applicants have herein amended claims 1, 6- 8, 10, 11, and 13-17 to correct minor informalities therein and to broaden the claims in certain respects. None of these amendments were intended to narrow the claims in any manner or were made for any purpose related to patentability. Applicants submit that all such claim amendments are fully supported by Applicants' originally filed specification.

Amendments to the Drawings

5. Applicants have amended FIG. 5 of the drawings to correct the orientation of reference numerals "105" and "110" such that they are readable from left to right. Applicants submit that all such drawing amendments are fully supported by Applicants' originally filed specification and, therefore, do not introduce any new matter into the specification.

New Claims

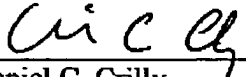
6. Applicants have herein added new claims 18-20 directed to additional features of the present invention. Applicants submit that such claims are fully supported by Applicants' originally filed specification and are patentably distinct from the prior art of record. Accordingly, Applicants request that the Examiner pass new claims 18-20 to allowance. With the addition of claims 18-20, twenty claims remain pending in the present application, two of which are independent. Applicants had previously paid for examination of twenty claims, three of which could be independent. Therefore, Applicants have not added any "extra" claims by virtue of the addition of claims 18-20. As a result, Applicants submit that no additional fees are due for the examination of new claims 18-20. If Applicants are in error in their understanding, please charge any additional filing fees to the undersigned's Deposit Account No. 50-1111.

7. The Examiner is invited to contact the undersigned by telephone, facsimile or email if the Examiner believes that such a communication would advance the prosecution of the instant application. Please charge any necessary fees associated herewith, including extension of

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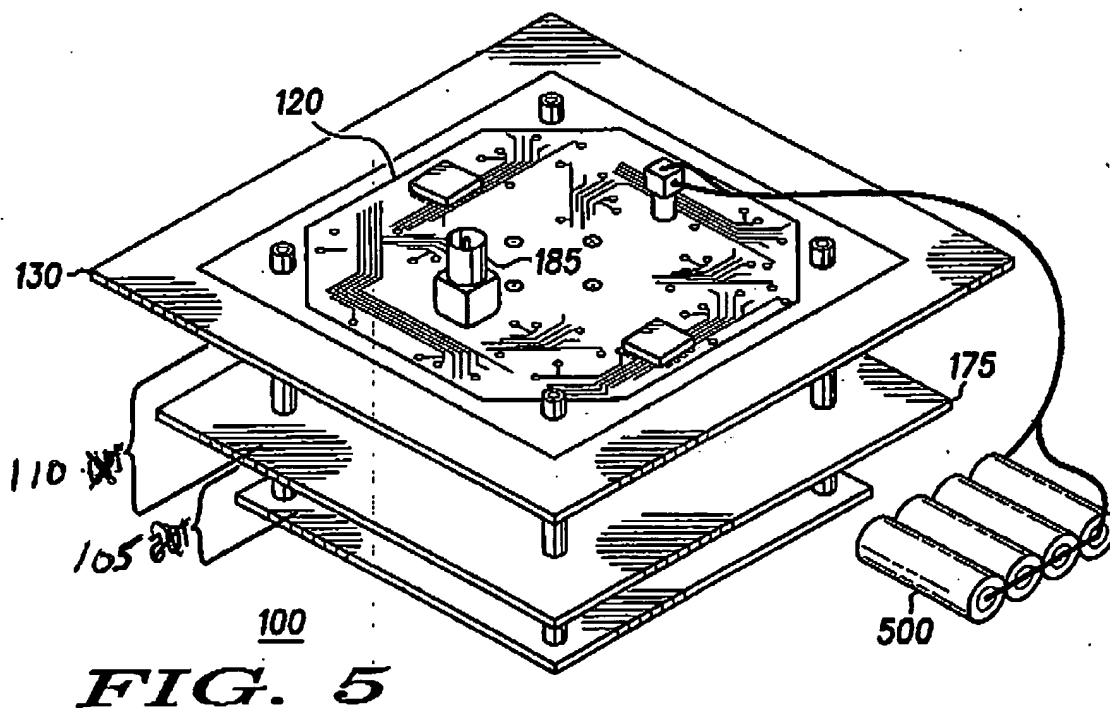
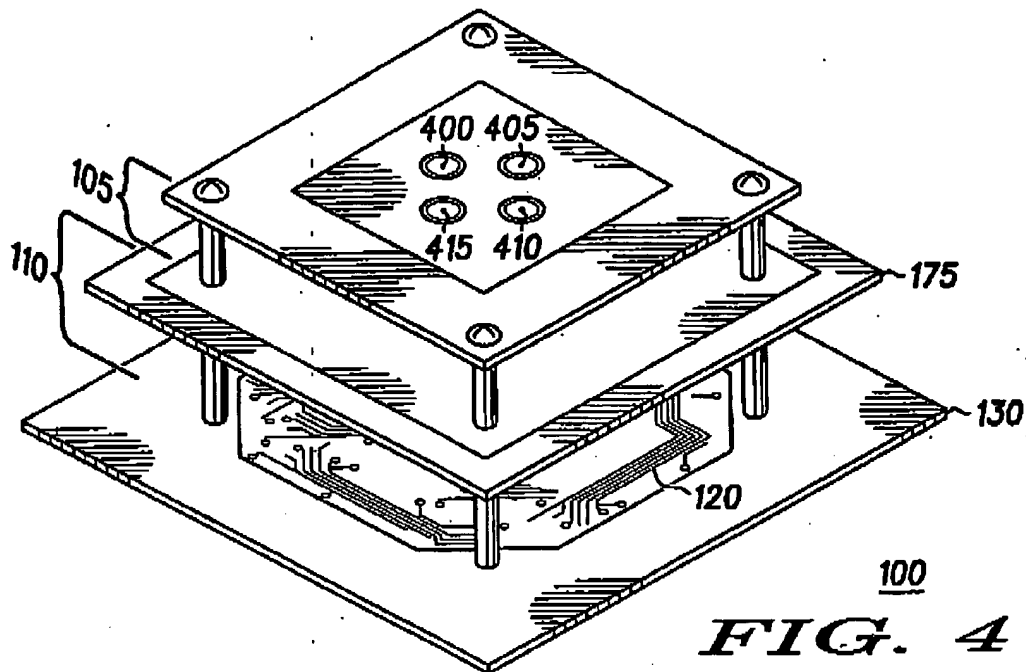
time fees (if applicable and not paid by separate check), to the undersigned's Deposit Account No. 50-1111.

Respectfully submitted,

By: 
Daniel C. Crilly
Attorney for Applicants
Reg. No.: 38,417
BRINKLEY, MCNERNEY,
MORGAN, SOLOMON & TATUM, LLP
200 East Las Olas Blvd., Suite 1900
Ft. Lauderdale, FL 33301
Phone: (954) 522-2200/Fax: (954) 522-9123
Email: daniel.crilly@brinkleymcnerney.com

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